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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/812,431	03/20/2001	Earl C. Herleikson	10991734-1	9848

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PHILIPS INTELLECTUAL PROPERTY & STANDARDS
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EXAMINER	
ODOM, CURTIS B	
ART UNIT	**PAPER NUMBER**
2634	

DATE MAILED: 03/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/812,431	HERLEIKSON ET AL.	
	Examiner	Art Unit	
	Curtis B. Odom	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 December 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11,17,18,20-22 and 24-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11,17,18,20-22 and 24-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 March 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 12/20/2005 have been fully considered but they are not persuasive. Applicant states Abraham (U.S. Patent No. 6, 4507, 978) is non analogous prior art to either the present application or to the Fuller reference. However, while the majority of the Abraham patent is associated with multiplexing data and information carrier over power lines, Abraham discloses a method of generating a spread spectrum signal which he deems as "known by those of ordinary skill in the art" (see column 18, lines 31-52) in which he applies to his invention. This teaching of a well-known method of generating a spread spectrum signal is analogous to the Fuller reference in that the Fuller reference discloses that generating spread spectrum signals can be used to measure physiological conditions (see Fuller, column 6, lines 1-21). Therefore, it would have been obvious to one skilled in the art that since Abraham discloses the generation of the spread spectrum signal is "known by those of ordinary skill in the art" that this teaching could have been applied to Fuller to generate spread spectrum signals. Newly cited Kadin (U. S. Patent 4, 653, 068) recites numerous advantages as to why systems implement spread spectrum technology (column 1, lines 17-21).

Regarding claims 18 and 27, it is the understanding of the Examiner that Fuller does in fact disclose measuring a contact impedance present between a portion of a specimen and a probe contacting the portion of a specimen (column 22, lines 12-26).

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 6-9, 21, 22, 24, 26, and 28 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Regarding claims 6-9 and 24 amended claim 6 currently recites the limitation "analyzing the measured parameter signals at a plurality of the randomly changed frequencies to determine the desired condition based on measured impedance signals least contaminated by noise within the selected frequency spectrum." However, after reviewing the specification, it is the understanding of the examiner that the desired condition is determined based on all the measured impedance signals, not simply the signals contaminated least by noise. The examiner cannot find disclosure describing "analyzing the measured parameter signals at a plurality of the randomly changed frequencies to determine the desired condition **based on measured impedance signals least contaminated by noise within the selected frequency spectrum**."

Regarding claims 21, 22, and 28, amended claim 28, recites the limitation "analyze the detected signal to measure a selected physiological condition at the plurality of frequencies to generate a plurality of redundant measurements of the physiological condition at least one of

which is isolated from interference on one or more of the plurality of frequencies." However, after reviewing the specification, the examiner cannot find disclosure describing **generating a plurality of redundant measurements** at least one of which is isolated from interference on one or some of the plurality of frequencies.

Regarding claim 26, claim 26 recites the limitation "wherein the analyzing means analyzes the physiological condition measured at each frequency for consistency, inconsistent measurements being indicative of interference". However, after reviewing the specification, the examiner cannot find disclosure describing **analyzing the physiological condition measured at each frequency for consistency, inconsistent measurements being indicative of interference**.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuller et al. (previously cited in Office Action 8/13/2004) in view of Kadin (U. S. Patent 4, 653, 068).

Regarding claim 1, Fuller et al. discloses a method for measuring a desired condition, in an environment which is contaminated by stray noise signals at various frequencies with a preselected spectrum (column 9, lines 49-60, wherein the implementation of bandpass filters shows contamination by noise signals at various frequencies) comprising:

generating (Fig. 2, block 50, column 5, line 48-column 6, line 21) a clock signal;

selecting frequencies with a preselected spectra (comb spectra) in accordance with the clock signal such that the frequencies within the spectrum are selected (column 5, line 66-column 6, line 21);

directing (5B, block 260, column 5, lines 11-25 and 48-59, and column 5, line 66-column 6, line 21) spread spectrum input signals into a medium at the frequencies;

detecting (Fig. 5B, block 250, column 13, lines 24-60 and column 16, lines 34-38) output signals from the medium, each output signal detected at a frequency (real and imaginary components of the reflected data signal) that corresponds to the frequency of a corresponding input signal directed into the medium (column 12, lines 41-52);

generating (Fig. 5B, block 280, column 12, lines 41-52 and column 13, lines 53-60) a measured parameter signal (impedance signal) from the detected parameter; and

analyzing (Fig. 5B, block 280, column 16, lines 19-24) the measured parameter signal to determine the desired condition.

Fuller et al. does not disclose randomizing the clock signal to generate randomized selected frequencies from the clock signal wherein the frequencies are randomly changed such that the frequencies of the input and output signals randomly change in unison. However, Fuller et al. discloses a spread spectrum transmission technique in which the clock signal (oscillator) used to generate the frequencies in the spectrum could comprise a plurality of signal (spread spectrum) generators whose frequency outputs may not be harmonically related or harmonically spaced apart (column 6, lines 1-21).

Kadin also discloses a spread spectrum communication technique (Fig.1, column 3, lines 29-45) where a clock signal is randomized (Fig. 1, block 1) to produce randomly selected frequencies (column 3, lines 29-42) which are randomly changed (based on the pseudo-random sequence) such that the frequencies transmitted/received are randomly changed in unison (column 4, lines 4-17). This spread spectrum transmission method is known as frequency hopping. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the spread spectrum transmission method of Fuller et al. to incorporate the spread spectrum transmission method (frequency hopping) of Kadin since Kadin states frequency hopping creates signals that are not influenced by interference caused by multipath fading (column 1, lines 17-21).

Regarding claims 2-5, which inherit the limitations of claim 1, Fuller et al. discloses transmitting spread spectrum voltage signals into the medium (column 9, lines 54-62) and detecting a parameter that corresponds to the signal directed into the medium comprises measuring the voltage signals (column 8, lines 19-27, column 9, lines 54-62, and column 16, lines 19-24). Fuller et al. and does not disclose transmitting current signals into the medium and measuring voltage signals for detecting a parameter of the signal and vice versa. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made since the measured parameter signal generated from the detected parameter comprises of an impedance signal (column 13, lines 53-60), that a current signal or a voltage signal could have been directed into the medium, and a current or voltage signal could have been measured to detect a parameter in the signal since an impedance signal can be derived from either a voltage or current signal. Impedance can be measured by inputting a current signal into a medium and

measuring a voltage drop across the medium due to impedance (and vice versa). Thus, inputting and measuring a current or voltage signal would produce the same result (impedance signal). The operation of choosing a voltage or current signal is deemed a design choice and does not constitute patentability.

6. Claims 1 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eggleton et al. (U. S. Patent No. 4, 035,839) in view of Kadin (U. S. Patent 4, 653, 068).

Regarding claim 1, Eggleton et al. discloses a method for measuring a desired condition, in an environment which is contaminated by stray noise signals at various frequencies within a preselected spectrum comprising:

selecting frequencies randomly within a preselected spectrum such that the frequencies within the spectrum are randomly selected (column 3, lines 10-19);

directing (column 3, lines 10-19) the signals into a medium at the randomly selected frequencies;

detecting (column 3, lines 20-46) output signals from the medium, each output signal detected at a frequency that corresponds to the frequency of a corresponding input signal directed into the medium (column 12, lines 41-52);

generating (column 3, lines 20-34, instantaneous intensity of ultrsound) a measured parameter signal from the detected parameter; and

analyzing (column 3, lines 20-34, display of ultrasound) the measured parameter signal to determine the desired condition.

Eggleton et al. does not disclose randomizing a clock signal to generate randomized selected frequencies from the clock signal wherein the frequencies are randomly changed such that the frequencies of the input and output signals randomly change in unison.

Kadin also discloses a spread spectrum communication technique (Fig.1, column 3, lines 29-45) where a clock signal is randomized (Fig. 1, block 1) to produce randomly selected frequencies (column 3, lines 29-42) which are randomly changed (based on the pseudo-random sequence) such that the frequencies transmitted/received are randomly changed in unison (column 4, lines 4-17). This spread spectrum transmission method is known as frequency hopping. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the random frequency generation method Eggleton et al. to incorporate the spread spectrum transmission method (frequency hopping) of Kadin since Kadin states frequency hopping creates signals that are not influenced by interference caused by multipath fading (column 1, lines 17-21).

Regarding claim 10, which inherits the limitations of claim 1, Eggleton et al. discloses the frequency spectrum is an ultrasonic frequency spectrum and the step of directing the input signals into the medium comprises transmitting ultrasound signals into the medium at the randomly changed frequencies (column 3, lines 10-19).

7. Claims 17, 18, 20, 25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuller et al. (previously cited in Office Action 8/13/2004) in view of Abraham (previously cited in Office Action 3/29/2005).

Regarding claim 17, Fuller et al. discloses a spread spectrum measurement device for measuring a desired physiological condition of a patient while avoiding degradation in an

accuracy of the measured physiological conditions due to interference from nearby electronic equipment, the device (Figs. 1-5B), comprising:

means (Fig. 2, block 50, Figs. 5A and 5B, block 260, column 5, lines 11-25 and 48-59, and column 5, line 66-column 6, line 21) for transmitting signals at different frequencies into a medium;

means (column 9, line 54-column 10, line 14) for detecting signals from the medium at different frequencies;

means (column 9, line 54-column 10, line 14) for generating a measured parameter from pairs of the transmitted and detected signals at common frequencies; and

means for analyzing (column 10, lines 40-55) the measured parameter signal to measure the desired physiological condition; and

means for generating (column 6, lines 1-21) a clock signal.

Fuller et al. does not disclose the device contains a random number generator and a divider which receives a clock signal and generated random numbers to generate a randomized clock signal, the randomized clock signal being conveyed to the transmitting means and to the detecting means to control the transmitting means and the detecting means to transmit and detect signals an random frequencies across a selected spectrum. However, Fuller et al. disclose that the clock signal (oscillator) used to generate the frequencies in the spectrum could comprise a plurality of signal (spread spectrum) generators whose frequency outputs may not be harmonically related or harmonically spaced apart (column 6, lines 1-21). Abraham discloses a known apparatus for generating a spread spectrum signal including a random signal generator for generating a clock signal that is used to spread a signal directed into a medium across a desired

frequency by randomizing a clock signal with a random number generator and a divider (Fig. 18, column 18, lines 29-52). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the spread spectrum signal generation of Fuller with the teachings of the spread spectrum generation of Abraham since spread spectrum creates signals that are not influenced by interference caused by multipath fading.

Regarding claim 18, Fuller discloses the spread spectrum measurement device of claim 18 (see rejection of claim 17) including the device at least partially comprised within a computer readable medium (column 13, lines 47-67) and determining a desired physiological condition including contact impedance (column 22, lines 12-26).

Regarding claim 20, Fuller et al. discloses a spread spectrum medical diagnostic measurement device (Figs. 2, 5A, and 5B), comprising:

a medium interface (Fig. 5B, block 300);

a signal transmitter (Fig. 5B, block 260, column 5, lines 11-25 and 48-59, and column 5, line 66-column 6, line 21) which transmits a spread spectrum electrical input signal to the medium interface;

a signal detector (Fig. 5B, block 250, column 13, lines 24-60) configured to detect a spread spectrum signal at the medium interface, the signal detector being in electrical communication with the medium interface; and

a signal processor (Figs. 5A and 5B, block 280, column 12, lines 40-51 and column 16, lines 19-24) configured to analyze the spread spectrum signal detected by the signal detector.

Fuller does not disclose a random signal generator configured to generate a clock signal that is used to spread randomly change frequencies, the signal directed into a medium randomly

around a selected frequency spectrum by randomizing the clock signal with a random number generator and a divider. However, Fuller et al. disclose that the clock signal (oscillator) used to generate the frequencies in the spectrum could comprise a plurality of signal (spread spectrum) generators whose frequency outputs may not be harmonically related or harmonically spaced apart (column 6, lines 1-21). Abraham discloses a known apparatus for generating a spread spectrum signal including a random signal generator for generating a clock signal that is used to randomly (random spreadin sequence) change frequencies, the signal directed into a medium randomly around the selected frequency spectrum (3.5MHZ to 10.5MHZ) by randomizing a clock signal with a random number generator and a divider (Fig. 18, column 18, lines 29-52). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the spread spectrum signal generation of Fuller with the teachings of the spread spectrum generation of Abraham since pread spectrum creates signals that are not influenced by interference caused by multipath fading.

Regarding claim 25, which inherits the limitations of claim 17, Fuller et al. discloses the analyzing means determines impedance at each of the transmitted and detected frequencies (column 12, lines 41-51).

Regarding claim 27, which inherits the limitations of claim 20, Fuller et al. discloses the signal processor determines at least one of contact impedance, heart rate, and respiration rate from the analyzed spread spectrum detected signal (column 22, lines 12-26, contact impedance).

8. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eggleton et al. (U. S. Patent No. 4, 035,839) in view of Kadin (U. S. Patent 4, 653, 068) and in further view of Feldman et al. (previously cited in Office Action 8/13/2004).

Regarding claim 11, Eggleton et al. and Kadin disclose all the limitations of claim 11 (see rejection of claim 10) including analyzing echoes at the random frequencies of the ultrasound signal (Eggelton et al., column 3, lines 19-46). However, Eggleton et al. and Kadin do not disclose analyzing echoes of the ultrasound signal to determine the heart rate of a patient.

Feldman et al. discloses analyzing echoes (reflected energy) of an ultrasound signal to determine a fetal heart rate (column 1, lines 28-41). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method/device of Eggleton et al. and Kadin with the teachings of Feldman et al. and analyze the ultrasound signal to determine the heart rate of a patient which would increase the overall functioning capacity and flexibility of the device by now being able to not only detect ultrasound images but also heart rate using the ultrasound signal.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Welch et al., "Practical Spread Spectrum Pulse Compression for Ultrasonic Tissue Imaging", IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control, Vol. 45, No. 2, March 1998, pages 349-355, discloses ultrasonic imaging using spread spectrum signals.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 571-272-3046. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Curtis Odom
March 5, 2006

MOHAMMED GHAYOUR
SUPERVISORY PATENT EXAMINER